

CLAIMS

1. An optical reader for scanning a mark carried by an article using scanning light, detecting light reflected from said mark, and thus reading information represented by said mark, comprising:

5 a light source;
a scanning means that is driven by a driving means and scans light emanating from said light source;

10 a plurality of reflection mirrors for reflecting scanning light scanned by said scanning means and creating a scanning pattern composed of a plurality of scan trajectories;

15 a read window through which scanning light reflected from said reflection mirrors is emitted; and

a light receiving means for receiving light reflected from said mark,

20 said optical reader further comprising:
a mode changing means for changing a plurality of operation modes among which one or ones of said plurality of scan trajectories to be validated for reading are different;

25 said plurality of operation modes including a specific scanning ray mode in which reading said mark using only a specific scan trajectory constituting said scanning pattern is validated and reading said mark using the other scan trajectories is invalidated.

30 2. An optical reader according to claim 1, wherein: said read window comprises a first area and a second area;

scanning rays tracing said other scan trajectories are output through said first area; and

35 a scanning ray tracing said given scan trajectory is output through said second area.

3. An optical reader according to claim 2, wherein said first area is a first read window, and said second

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area is a second read window independent of said first read window.

4. An optical reader according to claim 3, wherein:

5 the emission direction of a scanning ray tracing said given scan trajectory is obliquely up relative to scanning rays tracing said other scan trajectories; and

10 said second read window is located above said first read window, and the face of said second read window is located obliquely to the face of said first read window.

5. An optical reader according to claim 1, wherein:

15 said scanning means is a rotary polygon mirror that has a plurality of reflection surfaces and that is driven to rotate by means of said driving means; and

20 at least one of said plurality of reflection surfaces is placed at an angle, which is different from an angle at which the other reflection surfaces are placed, with respect to an axis of rotation of said rotary polygon mirror.

25 6. An optical reader according to claim 1, wherein said reflection mirrors include a first group of reflection mirrors for determining said other scan trajectories and a second group of reflection mirrors for determining said given scan trajectory.

30 7. An optical reader according to claim 6, wherein said second group of reflection mirrors comprises a single reflection mirror.

35 8. An optical reader according to claim 7, wherein said other scan trajectories are traced by a plurality of intersecting scanning rays, and said given trajectory is traced by a scanning ray scanned in one direction.

9. An optical reader according to claim 1, wherein the focal position of scanning rays tracing said other

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scan trajectories is set to a position separated by a first distance from said first area, and the focal position of a scanning ray tracing said given scan trajectory is set to a second position that is closer to said read window than said first position.

10. An optical reader according to claim 9, wherein said second position lies on the face of said second area of said read window.

11. An optical reader according to claim 1, wherein a scan width on said read window permitted by a scanning ray tracing said given scan trajectory is larger than a scan width on said read window permitted by scanning rays tracing said other scan trajectories.

12. An optical reader according to claim 1, further comprising emission position indicating means for indicating positions between which a scanning ray tracing said given scan trajectory is emitted through said read window.

13. An optical reader according to claim 12, wherein said emission position indicating means are marks inscribed on the sides of said read window.

14. An optical reader according to claim 12, wherein said emission position indicating means are indicating means for indicating the start point and end point of scanning light emitted through said read window and notifying a user of the fact that reading said mark is completed.

15. An optical reader according to claim 12, wherein said emission position indicating means are projections projecting from positions coincident with said start point and end point of scanning light emitted through said read window.

16. An optical reader according to claim 15, wherein said projections are extending to said focal position of a scanning ray that is emitted through said read window and that traces said given scan trajectory.

17. An optical reader according to claim 3, wherein

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said second read window is located at a position receding from said first read window.

5 18. An optical reader according to claim 17, further comprising a transparent cover attached to the face of said second read window, wherein said focal position of a scanning ray that is emitted through said second read window and traces said given scan trajectory lies at the tip of said transparent cover.

10 19. An optical reader according to claim 1, further comprising a mode selection instructing means for instructing which of said plurality of operation modes should be selected, wherein said mode changing means selects an operation mode instructed by said mode selection instructing means.

15 20. An optical reader according to claim 19, wherein said mode selection instructing means is a switch to be manipulated by a user.

20 21. An optical reader according to claim 19, wherein said switch has a switch plate that is placed on the top of said switch and that pressurizes said switch.

22. An optical reader according to claim 19, wherein:

25 said mode selection instructing means comprises a plurality of manipulable parts; and the contents of instruction made by said instructing means are changed into the contents of instruction other than selection of any of said plurality of operation modes according to whether one of said plurality of manipulable parts is manipulated or said
30 plurality of manipulable parts are manipulated simultaneously.

35 23. An optical reader according to claim 19, wherein said mode selection instructing means includes a detecting means located on at least one of the lateral sides of said optical reader, and any of said plurality of operation modes is selected according to a mounted state of said optical reader which is detected on the

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basis of an output of said detecting means.

24. An optical reader according to claim 19,
wherein:

5 said optical reader can be mounted in a
specific holding member;

 said mode selection instructing means is a
set detecting means for detecting whether or not said
optical reader is mounted in said specific holding
member; and

10 when said set detecting means detects that
said optical reader is mounted in said specific holding
member, an operation mode other than said specific
scanning ray mode is selected.

25. An optical reader according to claim 24,
15 wherein said set detecting means is a switch to be pushed
by a jut formed on said specific holding member when said
optical reader is mounted in said specific holding
member.

26. An optical reader according to claim 24,
20 wherein said set detecting means is a specific mark
detecting means that when said optical reader is mounted
on said specific holding member, detects if scanning
light emitted through one of said areas of said optical
reader has detected said mark.

27. An optical reader according to claim 19,
25 further comprising a second instructing means for use in
designating an operation mode, wherein an operation mode
is selected according to a combination of the state of
said first instructing means and the state of said second
30 instructing means.

28. An optical reader according to claim 1, wherein
said mode changing means gives control so that in said
given operation mode, said light source will be lit only
for a period during which a scanning ray tracing said
35 given scan trajectory is being output.

29. An optical reader according to claim 28,
wherein said specific scan trajectory validating means

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gives control so that in any mode other than said given operation mode, said light source is put out for a period during which scanning rays tracing said other scan trajectories are being output.

5 30. An optical reader according to claim 1, wherein said specific scan trajectory validating means gives control so that in said given operation mode, the operation of said light receiving means will be validated only for a period during which a scanning ray tracing
10 said given scan trajectory is being output.

 31. An optical reader according to claim 30, wherein said specific scan trajectory validating means gives control so that in any mode other than said specific operation mode, the operation of said light
15 receiving means will be invalidated for a period during which scanning rays tracing said other scan trajectories are being output.

 32. An optical reader according to claim 31, wherein invalidating the operation of said light
20 receiving means is invalidation of decoding of said read mark.

 33. An optical reader according to claim 3, wherein said light source, scanning means, plurality of reflection mirrors, read window, and light receiving
25 means are stowed in a head, further comprising a grip that communicates with said head and enables a user to grasp said optical reader.

 34. An optical reader according to claim 33, wherein the back side of said head is molded obliquely.

30 35. An optical reader according to claim 33, wherein the back side of said head is molded to be angled in the emission direction of scanning light emitted through said second area.

35 36. An optical reader according to claim 34, wherein the back side of said head has a concave dent formed so that scanning light emitted through said second area can be discerned.

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37. An optical reader according to claim 1 further comprising a notifying means for notifying a user of a selected mode.

5 38. An optical reader according to claim 37, wherein said notifying means is an indicating means, and the indication form of said indicating means is varied depending on a selected mode.

39. An optical reader according to claim 38, wherein said indicating means selects continual
10 indication or intermittent indication according to a selected mode.

40. An optical reader according to claim 37, wherein said notifying means is a speaker for generating a notification sound, and the notification sound is
15 varied depending on a selected mode.

41. An optical reader according to claim 37, wherein said notifying means is a means for reporting the result of reading of said mark, and the notification form for the result of reading to be notified by said
20 notifying means is varied depending on a selected mode.

42. An optical reader for scanning a mark carried by an article using scanning light, detecting light reflected from said mark, and thus reading information represented by said mark, comprising:

25 a light source;

a scanning means that is driven by a driving means and scans light emanating from said light source;

30 a plurality of reflection mirrors for reflecting scanning light scanned by said scanning means and creating a scanning pattern composed of a plurality of scan trajectories;

a read window through which scanning light reflected from said reflection mirrors is emitted;

35 a head including a light receiving means for receiving light reflected from said mark; and

~~a grip communicating with said head and~~

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enabling a user to grasp said optical reader.

43. A switch, comprising:

a switch body incorporated in an apparatus; and

a switch plate that is attached to the top of said switch body and that depresses said switch body when manipulated; wherein:

said switch plate is supported at two or more supporting points; and

when said switch plate is manipulated, said switch plate is pivoted in a manipulated direction with said supporting points as fulcrums and said switch body is pressed.

44. A switch according to claim 43, wherein said supporting points are three supporting points arranged in the form of a triangle, and said switch plate is held on said apparatus at said three supporting points.

45. A stand on which an optical reader, which has a read window through which scanning light is emitted and a grip enabling a user to grasp said optical reader, and which scans a mark borne by an article using scanning light emitted through said read window, detects light reflected from said mark, and thus reads information, is mounted, comprising:

a holder section in which said grip is mounted so that said grip can be dismounted freely; and a base for supporting said holder section so that said holder section can pivot;

said holder section having a slit, through which a cable coupled with said optical reader can pass, on the same side thereof as the side of said optical reader having said read window.

46. A stand according to claim 45, wherein a concave dent is formed from a position on said base coincident with a lower end of said grip of said optical reader mounted toward the forward side of said stand.

47. A stand according to claim 45, wherein said

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holder section has a member to be actuated with an instruction sent from said optical reader so that a state in which said optical reader is mounted on said stand can be reported to said optical reader.

5 48. A stand according to claim 47, wherein said member is shaped like a jut, and when said optical reader is mounted on said stand, said member pushes said instructing means.

10 49. A stand according to claim 47, wherein said member is a mark readable by said optical reader, and said mark is located at a position enabling scanning light emanating from said optical reader mounted on said stand to scan said mark.

15 50. A stand on which an optical reader, which includes a read window through which scanning light is emitted and a grip enabling a user to grasp said optical reader, and which scans a mark borne by an article using scanning light emitted through said read window, detects light reflected from said mark, and thus reads
20 information, is mounted, comprising:

a stand member on which said optical reader is mounted in such a manner that said grip of said optical reader will face laterally.

25 51. A stand according to claim 50, further comprising:

a holder section in which said grip is mounted so that said grip can be dismounted freely; and
a base for supporting said holder section so that said holder section can pivot;

30 said stand member having a tongue, which is inserted into said holder section so that said tongue can be removed freely, on a bottom thereof.

52. A stand according to claim 50, wherein when said optical reader is mounted in said stand member, said optical reader is held at an angle at which at least one scanning pattern, which is composed of a group of scanning rays, of scanning patterns created by scanning

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rays emitted through said read window of said optical reader, becomes horizontal.

~~53. An optical unit for an optical reader, comprising:~~

- 5 a plurality of reflection mirrors;
a laser light source;
a light reception sensor;
a condenser mirror that has a plane
mirror, which reflects laser light emanating from said
10 laser light source, around the center thereof and that
gathers incident light to said light reception sensor;
a rotary scanning means that has a
plurality of reflection surfaces for reflecting laser
light reflected from said plane mirror, that is driven to
15 rotate by means of a driving means, and that thus scans
said laser light; and
a frame which is molded as a united body
and in which said reflection mirrors, said laser light
source, said light reception sensor, said condenser
20 mirror, and said rotary scanning means are locked.

54. An optical unit according to claim 53, wherein said rotary scanning means is mounted on said frame via a cushioning member.

25 55. An optical unit according to claim 53, wherein:
said condenser mirror has both edges
thereof supported by said frame;

one edge of said condenser mirror is
supported so that it can move back and forth;

30 the other edge of said condenser mirror is
supported so that it can pivot with an axis of pivoting
extending in a longitudinal direction of said condenser
mirror as a center.

56. An optical unit, comprising:

35 an optical part having a first and second
stems formed coaxially on both edges thereof and a third
stem formed vertically to said second stem on one of the
edges thereof; and

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a frame on which said optical part is mounted, and which includes a first slit-like bearing into which said first stem is fitted, a second bearing into which said second stem is fitted, and a third elongated bearing into which said third stem is fitted and which forms an arc with said second bearing as a center.

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